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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/588,154

05/07/2008

Yukinobu Sugiyama

46884-5503

3653

55694 7590 11/10/2009  
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EXAMINER

LEE, JOHN R

ART UNIT

PAPER NUMBER

2878

MAIL DATE

DELIVERY MODE

11/10/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/588,154	<b>Applicant(s)</b> SUGIYAMA ET AL.	
	<b>Examiner</b> John R. Lee	<b>Art Unit</b> 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                                                 |                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                                             | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>05/07/2008, 11/03/2009</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites “a first adding and subtracting circuit, and a second adding and subtracting circuit” in lines 6-7. Claim 8 recites “and adding and subtracting circuit in lines 6-7. However, there is no adding conducted in the claimed subject matter in these claims. Therefore, these claims are indefinite as to what is meant by “adding” in these limitations.

Also, in claim 7, lines 19-20 and 26-27, the recitation of “the addition” lacks a proper antecedent basis and is indefinite as to what is being added.

Also, in claim 8, lines 19-20 and 26-27, the recitation of “said addition” lacks a proper antecedent basis and is indefinite as to what is being added.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Sugiyama et al. (JP 2003-189181, corresponding document EP 1 460 839 A1 is used as an English language translation; the citations below refer to the sections of the EP document; the rejection is based on the publication date of JP document).

Regarding claim 1, Sugiyama et al. teach a photo-detecting apparatus [see fig. 1] comprising: a photo-detecting section having: a plurality of pixels arranged in a two-dimensional array having M rows and N columns (M and N each represent an integer of 2 or more) [see sec. 0039] and each having a first photodiode and a second photodiode [12, 13, I sec. 0042] ; a plurality of lines provided for the respective rows so that the N first photodiodes included in the group of pixels constituting the m-th row ("m" represents any integer of 1 to M) of the two-dimensional array are electrically connected to each other through the line [see sec. 0049 et seq. and fig. 1]; and a plurality of lines provided for the respective columns so that the M second photodiodes, included in the group of pixels constituting the n-th column ("n" represents any integer of 1 to N) of the two-dimensional array are electrically connected to each other through the line [see sec. 0049 and also fig.1; also the connection of the lines are shown in fig. 2]; and a signal processing section [20 + 30] including M readout circuits [21 in fig. 4] and N readout circuits [31 in fig. 5], said signal processing section transferring an electric charge generated in said first photodiode connected to said line into said readout circuit to output a voltage value [see sec. 0058] in accordance with the charge quantity in said

readout circuit while transferring [see sec. 0061] an electric charge generated in said second photodiode connected to said line into said readout circuit to output a voltage value in accordance with the charge quantity in said readout circuit [sec. 0058].

Regarding claim 2, Sugiyama et al. teach that each of said readout circuits has a capacitive section for holding an electric charge; amplifying means [24] for outputting a voltage value according to the charge quantity held in said capacitive section [25]; transfer means [21] for transferring an electric charge generated in a photodiode to said capacitive section; and discharge means for discharging an electric charge in said capacitive section [26]; see fig.s 4 and 5.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al. (JP 2003-189181, corresponding EP 1 460 839 A1, providing an English language translation as noted above) in view of Mizuno (JP 8-330560, cited by the applicant).

Sugiyama et al fail to teach the details of the photodetector regions and conductivity types as recited in claim 3 and 4. Mizuno teaches in fig 2a a photodetector for having these arrangements (note regions 110, 120, and 130 with pn and np regions from top to bottom and the third region 130 formed on the periphery of the second region 120).

It would have been obvious to one of ordinary skill in the art to incorporate the photodiode structure of Mizuno into the device of Sugiyama et al. because this would be a mere incorporation of a known photodetector into a known photodetecting apparatus.

Claim 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al. (JP 2003-189181, corresponding EP 1 460 839 A1, providing an English language translation as noted above) in view of Kitamura et al. (JP 4-341062, cited by the applicant).

Sugiyama et al. fail to teach holding and subtracting circuits as recited in claims 5 and 6.

Kitamura et al. shows, in Fig. 11, a signal processing circuit having holding circuits (S/H) and subtracting circuits (Dif) for providing voltage differences from multiple photodetectors (see figs. 1, 2, and 6).

It would have been obvious to one of ordinary skill in the art to include the circuits of Kitamura et al. to provide additional signal processing for each set of voltage outputs from the two sets (A and B) of photodetectors of Sugiyama et al. because this would improve the output of the detectors of Sugiyama et al. by providing additional signal process as taught by Kitamura et al. This would be a mere incorporation of a known circuit (signal process) with a known photodetecting apparatus for providing a known function (signal processing as taught by Kitamura et al.).

### ***Allowable Subject Matter***

Claims 7 and 8 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. These claims would be

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allowable because the prior art fails to teach or fairly suggest the signal processing sections recited therein.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art made of record teaches various photodetector devices of interest.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John R. Lee whose telephone number is (571) 272-2477. The examiner can normally be reached on Monday through Friday, 7:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John R. Lee/  
Primary Examiner, Art Unit 2878